

Appl. No. 10/740,073
Amdt. dated 8/25/06
Reply to Office action of 4/25/06

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REMARKS/ARGUMENTS

Reconsideration of the application is requested.

Claims 9, 10, 12, 15-17 and 19-24 are now in the application.

Claims 9, 10, 12, 15-17 and 19-22 are subject to examination
and claims 23-24 have been withdrawn from examination.

Claims 9, 15 and 23 have been amended and claims 11, 13, 14
and 18 have been canceled. No claims have been added.

In "Claim Rejections - 35 USC § 102" on pages 2-4 of the
above-identified Office Action, claims 9, 12-14, 16-19 and
21-22 have been rejected as being fully anticipated by GB
Patent 1 434 824 (hereinafter GB '824) under 35 U.S.C. §
102(b).

In "Claim Rejections - 35 USC § 103" on pages 4-5 of the
Office Action, claims 10 and 20 have been rejected as being
obvious over GB '824 in view of GB Patent 1 548 046
(hereinafter GB '046) under 35 U.S.C. § 103(a).

In "Claim Rejections - 35 USC § 103" on page 5 of the Office
Action, claim 11 has been rejected as being obvious over GB
'824 under 35 U.S.C. § 103(a).

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The rejections have been noted and claim 9 has been amended in an effort to even more clearly define the invention of the instant application. Support for the changes is found in previous claims 11, 13, 14 and 18 of the instant application.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful. Claim 9 calls for, *inter alia*, a carbon fiber-reinforced coke, comprising:

a mixture of:

a proportion of cut carbon fibers being surface-oxidized or non-surface-oxidized or stabilized precursor fibers for forming PAN-based carbon fibers, and at least one of the following being true for said cut carbon fibers or stabilized precursor fibers upon entering the delayed coker, said fibers or precursor fibers:

not being provided with a sizing;

being provided with a sizing selected from the group consisting of sizings for satisfying objectives of various textile processes;

being provided with a sizing selected from the groups consisting of:

waxes, montan waxes, and waxes produced synthetically by esterification of fatty alcohols with long-chain fatty acids containing 12 to 40 carbon atoms;

polyurethane, phenolic, polyester, and epoxy resins; and

low-viscosity pitches and pitches dissolved in organic solvents;

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feedstock for a delayed coking process, said feedstock comprising a material selected from the group consisting of highly aromatic residues of vacuum distillation, residues of visbreaking, residues of a fluidized catalytic cracking process, residues of thermocracking, residues of ethylene pyrolysis, soft pitches produced from coal coking or by distillation of highly aromatic coal residues;

the mixture having been coked in a delayed coker;

said feedstock, upon entering the delayed coker, containing at most 4% by weight of said cut carbon fibers or 8% by weight of said stabilized precursor fibers; and

the coke having a coefficient of thermal expansion with values of at most $0.15 \times 10^{-6} \text{K}^{-1}$, measured on specimens produced in accordance with DIN 51930 in an extrusion direction and in accordance with DIN 51909.

Applicant will explain below some of the reasons why the claims of the instant application are patentable over the prior art:

1. In the paragraph bridging pages 2 and 3 of the Office action, the Examiner has stated that the burden is on Applicant to show an unobvious difference between GB '824 and claim 9 regarding coking in a delayed coker. The Examiner's attention is directed to page 6, lines 9-29, page 12, lines 17-20, page 15, lines 8-12 and elsewhere in the Specification of the instant application which teach the advantages of coking in a delayed coker. Applicant has therefore met his burden and this feature should be given patentable weight.

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2. In the first paragraph on page 4 of the Office action, the Examiner has stated with regard to claim 18 that the structure of the carbon product in GB '824 is the same or substantially similar to the claimed carbon product and therefore it should have the same properties with respect to its coefficient of thermal expansion. However, the properties are not the same. GB '824 appears to achieve at most a CTE (coefficient of thermal expansion) of $7 \times 10^{-7}/K$ while previous claim 18 and present claims 9, 19 and 22 of the instant application claim a coke, a product and an electrode reaching values of at most $1.5 \times 10^{-7}/K$.

In addition, the values recited in claim 9 cannot be obvious over the teachings of GB '824 since there are no hints or suggestions therein of any way in which the formation of the carbon fiber-reinforced coke might be modified to reach such values.

3. Furthermore, the Examiner has mentioned claim 11 in the middle of page 5 of the Office action. Previous claim 11 and present claim 9 call for the feedstock, upon entering the delayed coker, containing at most 4% by weight of the cut carbon fibers or 8% by weight of the stabilized precursor fibers. This certainly is far different than the value of less than 10% in GB '824 and the reason that the values of at

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most 4% by weight of the cut carbon fibers or 8% by weight of the stabilized precursor fibers was recited in the claim was because of its criticality. Rather than requiring routine skill in the art, these values have been carefully determined through experimentation by the inventor, as described in the Specification of the instant application.

4. It is also noted that claims 10 and 20 state that the carbon fiber reinforced coke is needle coke. As mentioned previously, GB '824 mentions coke (such as in claim 1 of GB '824) as well as carbon fibers (such as in claim 3 of GB '824) which are made from coal. Therefore, GB '824 must be assumed to be closely linked to coal-based coke. However, there is no hint in GB '824 pointing towards the use of (petroleum-based) needle coke. Although GB '824 uses the general term "carbon fiber" it becomes clear from the description as well as from the claims thereof that the carbon fibers are also coal-based.

5. Furthermore, GB '824 does not mention the use of oxidized fibers, i.e. pre-cursors to carbon fibers, as recited in claim 9 of the instant application.

6. In addition, it is noted that page 2, lines 26-30 of GB '824 point out the similarity of the raw materials (coal or

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extract) for all 3 materials (i.e. coke, fibers and binder) and that their use is particularly advantageous for the production of stronger and improved electrodes. This finding is also supported on page 2, lines 21-26 of GB '046, which points out issues related to different shrinkage behavior.

Therefore, since GB '824 points towards the utilization of very similar raw materials to achieve improved electrode properties, GB '824 cannot anticipate the use of a mixture of three quite different materials, each based on a different raw material, and in particular the use a mixture of petroleum-based needle coke, PAN-based oxidized fibers or carbon fibers, and coal-based binder pitch, to produce improved graphite electrodes, as recited in claims 10 and 20 of the instant application.

7. Besides the introduction of the fibers effectively in the delayed coker, the invention of the instant application in particular overcomes the prior art disadvantages by furnishing the fibers with a sizing or oxygen groups, as previously recited in claims 13 and 14 and now recited in claim 9.

Since the Examiner has not shown that GB '824 discloses the use of fibers with a sizing or oxygen groups, the limitations

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of claims 11, 13, 14 and 18 have been added to claim 9.

8. Finally, in addition to the fact that the claims of the instant application are not anticipated by GB '824, the subject matter thereof is also not obvious over GB '824 or GB '046 because none of the prior art teaches the way in which the formation of the carbon fiber-reinforced coke of the prior art would have to be modified to reach the subject matter of the claims of the instant application.

9. In contrast to the invention of the instant application, page 2, lines 21-26 of GB '046 point out issues related to the different shrinkage behavior of coke and fibers. This states a prejudice against the usage of fibers for the production of carbon electrodes. Therefore, a combination of GB '824 in view of GB '046 or vice versa could not render the subject matter of the claims of the instant application obvious.

10. The graphite electrodes according to the invention of the instant application are not only different from those in the prior art, as discussed above, but they excel with regard to performance as compared to the prior art electrodes.

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Clearly, neither GB '824 nor GB '046 show or suggest the limitations of the claims of the instant application.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claim 9. Claim 9 is, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claim 9.

In view of the foregoing, reconsideration and allowance of claims 9, 10, 12, 15-17 and 19-22 are solicited. Rejoinder of method claims 23 and 24 is again requested under MPEP 821.04. It is noted that claim 23 has been amended to include all of the limitations added to claim 9.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out.

Petition for extension is herewith made. The extension fee for response within a period of one month pursuant to Section 1.136(a) in the amount of \$120.00 in accordance with Section 1.17 is enclosed herewith.

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Please charge any other fees that might be due with respect
to Sections 1.16 and 1.17 to Deposit Account Number 12-1099
of Lerner Greenberg Sterner LLP.

Respectfully submitted



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LAG/lq

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